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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/027,119	12/20/2001	Pasi Leipala	413-010747-US(PAR)	3040

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PERMAN & GREEN
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FAIRFIELD, CT 06824

EXAMINER

CHO, UN C

ART UNIT	PAPER NUMBER
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2682

DATE MAILED: 04/15/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/027,119

Applicant(s)

LEIPALA, PASI

Examiner

Un C Cho

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. ____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>4</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 2/19/2002 was filed after the mailing date of the 12/20/2001 on Application 10/027119. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 4 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention

Regarding claim 4, the claim 4 recites the limitation "the reactance" in line 2.

Regarding claim 7, the claim 7 recites the limitation "the reactance" in line 1.

There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 - 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cygan et al. (US 5,564,086) in view of Green Jr. (US 5,701,595).

Regarding claim 1, Cygan teaches a power amplifier (Cygan, Fig. 1, 104), means for sampling forward and reflected components of the signal, a variable matching network (Cygan, Fig. 1, 111) and a processor (Cygan, Fig. 1, 110) for controlling the matching circuit on the basis of the provided samples of the forward and reflected components (Cygan, Col. 2, lines 55 – 65 and Col. 3, lines 7 – 20). However, Cygan fails to teach that said means for measuring the reflected field comprises an element which separates the reflected field to a separate path and which is connected to an output of the power amplifier in transmission path of a signal to be transmitted. In contrast, Green Jr. teaches a circulator (Green Jr., Fig. 5, 132) that separates the reflected field to a separate path and which is connected to an output of the power amplifier in transmission path of a signal to be transmitted (Green Jr., Col. 5, lines 46 – 55). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Green Jr. to Cygan to provide a half duplex RF transceiver which permits increased talk time in comparison with comparable prior art systems.

Regarding claim 2, Cygan fails to teach that said element separating the reflected field to a separate path is a circulator arranged to direct the reflected field to the control unit and furthermore, to prevent the reflected field from propagating to the power amplifier. However, Green Jr. teaches a circulator

(Green Jr., Fig. 5, 132) that separates the reflected field to a separate path and which is connected to an output of the power amplifier in transmission path of a signal to be transmitted (Green Jr., Col. 5, lines 46 – 55). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Green Jr. to Cygan to provide a half duplex RF transceiver which permits increased talk time in comparison with comparable prior art systems.

Regarding claim 3, Cygan teaches a sampler sampling forward and reflected field of the signal and providing these samples to a processor in order to change the impedance of the matching network (Cygan, Col. 2, lines 55 – 65).

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cygan in view of Green Jr. as applied to claim 1 above, and further in view of Sroka et al. (US 5,778,308).

Regarding claim 4, Cygan as modified by Green Jr. fails to teach that a matching circuit comprising at least one part the reactance of which can be controlled electrically. However, Sroka teaches a matching network (Sroka, Fig. 3A, 31) comprising at least one part the variable-reactance circuit (Sroka, Fig. 4, 41) of which can be controlled electrically (Sroka, Col. 4, lines 34 – 50).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Sroka to Cygan and Green Jr. to provide an improved adaptive antenna-matching network.

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7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cygan in view of Green Jr. as applied to claim 1 above, and further in view of Zhou et al. (US 6,611,691).

Regarding claim 5, Cygan as modified by Green Jr. fails to teach that the radio apparatus functions in at least two systems, said control unit comprising means for controlling the matching circuit also on the basis of frequency band information of said systems. However, Zhou teaches that the wireless communication device can be adapted to be used in more than one frequency band (AMPS, PCS or GSM) (Zhou, Col. 3, lines 1 – 5). Zhou also teaches that the processor (Zhou, Fig. 1, 103) controls the matching network (Zhou, Fig. 1, 130) according to the corresponding frequency band information (Zhou, Col 3, lines 60 – 64 and Col. 5, lines 62 – 66). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Zhou to Cygan and Green Jr. to provide a wireless device having an antenna which can operate on more than one frequency, including such an antenna being retractable and having a novel matching circuit for the up and down positions.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cygan in view of Green Jr. as applied to claim 1 above, and further in view of Satoh (US 5,880,635).

Regarding claim 6, Cygan as modified by Green Jr. teaches a processor controlling the matching circuit (Cygan, Col. 2, lines 55 – 65). However, Cygan as modified by Green Jr. fails to teach that the control unit controls the matching circuit on the basis of output power information of the power amplifier. In contrast, Satoh teaches the impedance being adjusted as a function of the power output level of the amplifier (Satoh, Col. 2, lines 4 – 6). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Satoh to Cygan and Green Jr. to provide a circuit, which optimizes the performance of a power amplifier in a signal transmitter.

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cygan in view of Green Jr. and Sroka as applied to claim 4 above, and further in view of Chang et al. (US 5,959,516).

Regarding claim 7, Sroka as modified by Cygan and Green Jr. teaches a matching network (Sroka, Fig. 3A, 31) comprising at least one part the variable-reactance circuit (Sroka, Fig. 4, 41) of which can be controlled electrically (Sroka, Col. 4, lines 34 – 50). However, Sroka as modified by Cygan and Green Jr. fails to teach that the reactance comprises at least one MEMS capacitor. In contrast, Chang teaches a high Q MEMS capacitor (Chang, Col. 4, lines 11 – 13). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Chang to Sroka, Cygan and Green Jr. to provide a high Q MEMS capacitor with a capacitance that is

reversibly trimmable or continuously tunable with a large tuning ration and is insensitive to the signal voltage.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Green Jr. (US 5,701,595) in view of Cygan et al. (US 5,564,086).

Regarding claim 8, Green Jr. teaches a portable digital cellular telephone having an antenna (Green Jr., Fig. 5, 10), an impedance matching load (Fig. 5, 38), a power amplifier feeding the antenna (Green Jr., Fig. 5, 22) and means for attenuating the reflected field, which separates the reflected field to a separate path (Green Jr., Col 5, lines 66 through Col 6, lines 6). However, Green Jr. fails to teach measuring a field reflected from the antenna towards the power amplifier and a control unit for controlling the matching circuit on the basis of the strength of the reflected field. In contrast, Cygan teaches sampling forward and reflected components of the amplified signal and providing these samples to a processor in order to change the impedance of the matching network (Cygan, Col. 2, lines 55 – 65). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teaching of Cygan to Green Jr. to provide a method and apparatus for enhancing an operating characteristic of a radio transmitter.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Un C Cho whose telephone number is (703)305-8725. The examiner can normally be reached on M ~ F 8:00AM to 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (703)308-6739. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Un C Cho *UC*
Examiner
Art Unit 2682
3/9/2004


LEE NGUYEN
PRIMARY EXAMINER